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FISH & RICHARDSON P.C. P.O BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER PHU, SANH D	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/762,153

Applicant(s)

CHEN ET AL.

Examiner

Sanh D. Phu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 54, 56 and 58 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-13, 17-21, 23-32, 34-43, 45-53, 55, 56, 57 is/are rejected.
- 7) ☒ Claim(s) 3, 14-16, 22, 33 and 44 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This Office Action, is responsive to the Response filed on 8/27/07.

#### *Claim Rejections – 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, 12, 13, 17–21, 23, 31, 32, 34, 42, 43, 45, 53, 55 and 57

are rejected under 35 U.S.C. 102(e) as being anticipated by Dowling

(6,597,732), newly-cited.

–Regarding claim 1, see figure 2C, col. 12, line 60 to col. 14, line 42,

Dowling discloses a transceiver (see figure 2C) comprising:

a receiver (comprising (230)) to receive an analog communication signal, the analog communication signal containing an interference signal;

a digital compensation circuit (comprising (240)) to generate a digital replica (y) of the interference signal contained in the analog communication signal;

a converter (241) to convert the digital replica of the interference signal into a corresponding analog replica of the interference signal; and

a subtraction circuit (243) to subtract the analog replica of the interference signal from the analog communication signal.

—Regarding claim 2, Dowling discloses that the digital compensation circuit includes an echo canceller (240) to generate a digital replica of an echo interference signal in the analog communication signal (see figure 2C).

—Regarding claim 4, Dowling discloses an analog-to-digital converter (235) to sample the analog communication signal having the analog replica subtracted therefrom, and generate a digital signal that is substantially devoid of the interference signal (see figure 2C).

-Regarding claim 12, as similarly applied to claims 1, 2 and 4 set forth above and herein incorporated, see figure 2C, col. 12, line 60 to col. 14, line 42, Dowling discloses a method (see figure 2C) for reducing interference signals in an analog communication signal, the method comprising:

procedure (comprising (230)) of receiving an analog communication signal through a receiver, the analog communication signal containing an interference signal;

procedure (240) of generating a digital replica of the interference signal contained in the analog communication signal;

procedure (241) of converting the digital replica of the interference signal into a corresponding analog replica of the interference signal; and

procedure (243) of subtracting the analog replica of the interference signal from the analog communication signal to substantially cancel the interference signal from the analog communication signal.

-Regarding claim 13, Dowling discloses that the interference signal is an echo interference signal (see col. 14, lines 6-15).

-Claim 17 is rejected with similar reasons set forth for claim 4.

-Regarding claim 18, as applied to claim 13, Dowling discloses that generating a digital replica of the interference signal includes generating a digital echo interference signal, (considered here equivalent with the limitation "a digital replica of a portion of the interference signal").

-Regarding claim 19, in Dowling, the echo interference signal, as a signal, inherently has voltage level(s), (considered here equivalent with the limitation "high voltage portions").

-Regarding claim 20, as similarly applied to claims 1, 2 and 4 set forth above and herein incorporated, see figure 2C, col. 12, line 60 to col. 14, line 42, Dowling discloses a transceiver (see figure 2C) comprising:

receiving means (comprising (230)) for receiving an analog communication signal, the analog communication signal containing an interference signal;

generating means (240) for generating a digital replica of the interference signal contained in the analog communication signal;

converting means (241) for converting the digital replica of the interference signal into a corresponding analog replica of the interference signal; and

subtracting means (243) for subtracting the analog replica of the interference signal from the analog communication signal to substantially cancel the interference signal from the analog communication signal.

-Claim 21 is rejected with similar reasons set forth for claim 2.

-Claim 23 is rejected with similar reasons set forth for claim 4.

-Regarding claim 31, as similarly applied to claims 1, 2 and 4 set forth above and herein incorporated, see figure 2C, col. 12, line 60 to col. 14, line 42, Dowling discloses a network device in a communication system, the network device comprising: a transceiver (see figure 2C) operable to receive an analog communication signal containing an interference signal, the transceiver including

a receiver (comprising (230)) to receive the analog communication signal;

a digital compensation circuit(240) to generate a digital replica of the interference signal contained in the analog communication signal;

a converter (241) to convert the digital replica of the interference signal into a corresponding analog replica of the interference signal; and  
a subtraction circuit (243) to subtract the analog replica of the interference signal from the analog communication signal.

-Claim 32 is rejected with similar reasons set forth for claim 2.  
-Claim 34 is rejected with similar reasons set forth for claim 4.  
-Regarding claim 42, as similarly applied to claims 1, 2 and 4 set forth above and herein incorporated, see figure 2C, col. 12, line 60 to col. 14, line 42, Dowling discloses a network device in a communication system, the network device comprising: communication means (see figure 2C) for receiving an analog communication signal containing an interference signal, the communication means including

receiving means (comprising (230)) for receiving the analog communication signal;

generating means (240)for generating a digital replica of the interference signal contained in the analog communication signal;

converting means (241)for converting the digital replica of the



interference signal into a corresponding analog replica of the interference signal; and

subtracting means (243) for subtracting the analog replica of the interference signal from the analog communication signal to substantially cancel the interference signal from the analog communication signal.

-Claim 43 is rejected with similar reasons set forth for claim 2.

-Claim 45 is rejected with similar reasons set forth for claim 4.

-Regarding claim 53, as similarly applied to claims 1, 2 and 4 set forth above and herein incorporated, see figure 2C, col. 12, line 60 to col. 14, line 42, Dowling discloses a cancellation system for use in a communication system (see figure 2C) including a communication line (137), the communication line inherently having a transmitter and a receiver at each end, the cancellation system to reduce interference signals in an analog communication signal received by a receiver (comprising (230)), the cancellation system comprising:

an echo canceller (240) associated with a receiver, the echo canceller to receive a transmitted signal (x) from a transmitter (comprising (220)) in a same transceiver (270) as the receiver with which the echo canceller is associated, the

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echo canceller operable to generate a digital replica echo interference signal based on the transmitted signal;

a converter (241) to convert the digital replica of the echo interference signal into a corresponding analog replica of the echo interference signal; and

a subtracter (243) to subtract the replica echo interference signal from an analog communication signal received by the receiver.

—Regarding claim 55, as similarly applied to claims 1, 2 and 4 set forth above and herein incorporated, see figure 2C, col. 12, line 60 to col. 14, line 42, Dowling discloses a cancellation system for use in a communication system including a communication line (137), the communication line inherently having a transmitter and a receiver at each end, the cancellation system to reduce interference signals in an analog communication signal received by a receiver (comprising (230)), the cancellation system comprising:

echo cancellation means (240) associated with the receiver, the echo cancellation means to receive a transmitted signal (x) from a transmitter (comprising (220)) in a same transceiver as the receiver with which the echo cancellation means is associated, the echo cancellation means for generating a

digital replica echo interference signal based on the transmitted signal;

converting means (241) for converting the digital replica of the echo interference signal into a corresponding analog replica of the echo interference signal; and

subtracting means (243) for subtracting the replica echo interference signal from an analog communication signal received by the receiver.

—Regarding claim 57, as similarly applied to claims 1, 2 and 4 set forth above and herein incorporated, see figure 2C, col. 12, line 60 to col. 14, line 42, Dowling discloses a method (see figure 2C) for reducing interference signals in an analog communication signal received by a receiver (comprising (230)) of a communication line (137), the method comprising:

procedure (240) of receiving a transmitted signal (x) from a transmitter (comprising (220)) in a same transceiver (270) as the receiver;

procedure (240) of generating a digital replica echo interference signal based on the transmitted signal;

procedure of (241) of converting the digital replica of the echo interference signal into a corresponding analog replica of the echo interference

signal; and

procedure (243) of subtracting the replica echo interference signal from an analog communication signal received by the receiver.

*Claim Rejections – 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5, 24, 35 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Druihe (6,452,967), previously-cited.

–Regarding to claims 5, and similarly applied to claims 24, 35, 46, Dowling does not teach a FIFO buffer to receive the digital signal and store the digital signal on a first-in-first-out basis.

Druihe teaches a phase locked loop (PLL) for providing a clock signal (CLK) for an ADC (A/D CONVERTER) and a FIFO buffer (MM) to receive the digital signal and store and retrieve the digital signal output of the ADC on a

first-in-first-out basis in order to absorb the jitter of the phase locked loop (see figure 2, and col. 8, lines 56-63).

Since in Dowling, a clock signal is inherently needed in the ADC (235) (see figure 2C) for sampling the analog communication signal, and Dowling does not teach how the clock signal of the ADC is provided, it would have been obvious for a person skilled in the art to additionally implement Dowling with a phase locked loop and a FIFO buffer, as taught by Druihe, in such a way that the phase locked loop would provide the clock signal for the ADC, and the FIFO would receive and retrieve the digital signal on a first-in-first-out basis for further processing so that with such the implementation, the clock signal would be provided as required and the digital signal of the ADC outputted from the FIFO buffer would be free of jitter and ready for further processing.

6. Claims 6-10, 25-29, 36-40, 47-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Druihe and further in view of Roo (6,775,529), previously-cited.

-Regarding to claim 6, and similarly applied to claims 25, 36, 47, Dowling in view of Druihe does not teach a feed forward equalizer (FFE) to

receive the digital signals from the FIFO buffer, the FFE operable to filter individual digital signals, as claimed.

Roo teaches using a FFE (16) to remove intersymbol interference from a received digital signal (see figure 4, col. 6, lines 15-19).

It would have been obvious for a person skilled in the art to additionally implement Dowling invention in view of Druihe with a FFE, as taught by Roo, in such a way that the FFE would filter individual digital signals in order to remove possible intersymbol interference from the digital signals outputted from the FIFO buffer so that the digital signals would be free of possible intersymbol interference for further processing.

-Regarding to claim 7, and similarly applied to claims 26, 37, 48, Dowling in view of Druihe and Roo does not teach that the FFE is LMS type adaptive filter. However, Dowling in view of Druihe and Roo teach that the FFE is a finite impulse response (FIR) equalizer (see Roo, col. 5, lines 2-7). On the other hand, implementing a FIR equalizer as a LMS type adaptive filter is well-known in the art, and the examiner takes Official Notice. Since Dowling in view of Druihe and Roo does not teach in detail how the FFE is implemented, it

would have been obvious for a person skilled in the art to implement the FFE as a LMS type adaptive filter so that the FFE would be provided as required.

-Regarding to claim 8, and similarly applied to claims 27, 38, 49, Dowling in view of Druihe and Roo teaches that the invention is configurable to further comprise a data detector to detect data from the filtered individual digital signals (see Roo, (18) of figure 4).

-Regarding to claim 9, and similarly applied to claims 28, 39, 50, Dowling in view of Druihe and Roo teaches that the data detector is a Viterbi detector detector to detect data from the filtered individual digital signals.

-Regarding to claim 10, and similarly applied to claims 29, 40, 51, in Dowling in view of Druihe and Roo, inherently the data is an electrical data symbol (see Roo, (PSC) of figure 4).

7. Claims 11, 30, 41 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Roo.

-Regarding claim 11, and similarly applied to claims 30, 41 and 52, Dowling does not teaches that the transceiver is IEEE 1000Base-TX complaint.

Roo teaches that IEEE 1000Base-TX technology for very high data throughput is available at the time the invention was made (see col. 1, lines 15-22).

For designing a very high data throughput transceiver, it would have been obvious for one skilled in the art to implement Dowling transceiver to be IEEE 1000Base-TX compliant so that with such the implementation, data throughput would be improved and be able to handle very high data throughput.

*Allowable Subject Matter*

8. Claims 54, 56 and 58 are allowed.
9. Claims 3, 14-16, 22, 33 and 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Response to Arguments*

10. Applicant's arguments filed on 8/27/07 have been fully considered. As results, the previous rejections have been withdrawn.



*Conclusion*

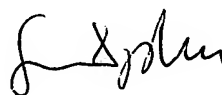
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sanh D. Phu whose telephone number is (571)272-7857. The examiner can normally be reached on M-Fr from 8:00-16:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on (571) 272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sanh D Phu  
Primary Examiner  
Art Unit 2618

9/25/07



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